

Outdoor Retail Lighting

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Benya Lighting Design

Outdoor Retail Lighting



Description

- For outdoor sales areas NOT under canopies.
- Emphasis on auto sales.
- LPD maximums will vary by four lighting zones and by classification (auto sales vs. general uses).



Design Criteria

- IESNA Lighting Handbook, 9th Edition, on “Lighting Design Guide.”
- Lighting design criteria is selected for the four lighting zones:
 - LZ1 (not permitted).
 - LZ2 (IESNA “dark surround”).
 - LZ3 (IESNA “light surround”).
 - LZ4 (2x LZ3 for extreme conditions).

•Charles Eley:
•OK, this is consistent with the report.



Design Criteria Decisions

1. Not allowed in LZ1.
2. Security lighting is an issue in certain locations.
3. For auto sales (front row of cars):
 - LZ1 = Not permitted.
 - LZ2 = 10 fc IESNA secondary or “town.”
 - LZ3 = 20 fc IESNA competitive or “city.”
 - LZ4 = 40 fc 2x LZ3.
4. Other retail = 50% of auto frontage.



Observation

- IESNA values for exterior lighting tend to be in factors of 2x when going from one condition to the next.
- IESNA current standards are limited to primary and secondary markets.
- Extrapolation of IESNA values into LZ4 may be accomplished using power of 2.



Lighting Equipment used in Primary Model

Lamps and ballasts:

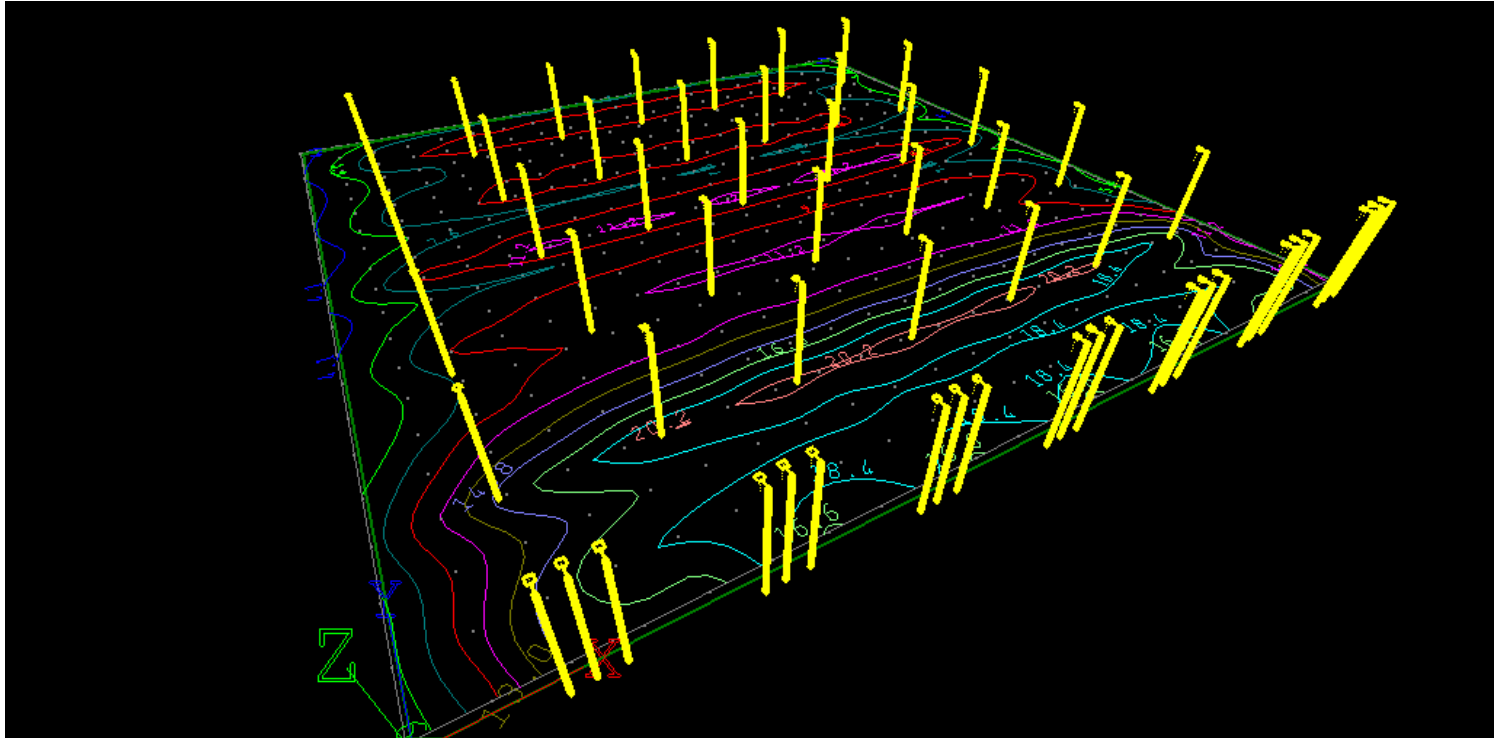
- Metal Halide lamps pulse start, horizontal burn position.
- Mean lumens.
- CWA ballasts.

Luminaires:

- Forward throw cut off metal halide.
- Light Loss Factor of 0.70.
- Luminaire located as shown.



Primary Lighting Model



Sales lot, front row of cars 5-10' back of front row of lights.

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Calculations

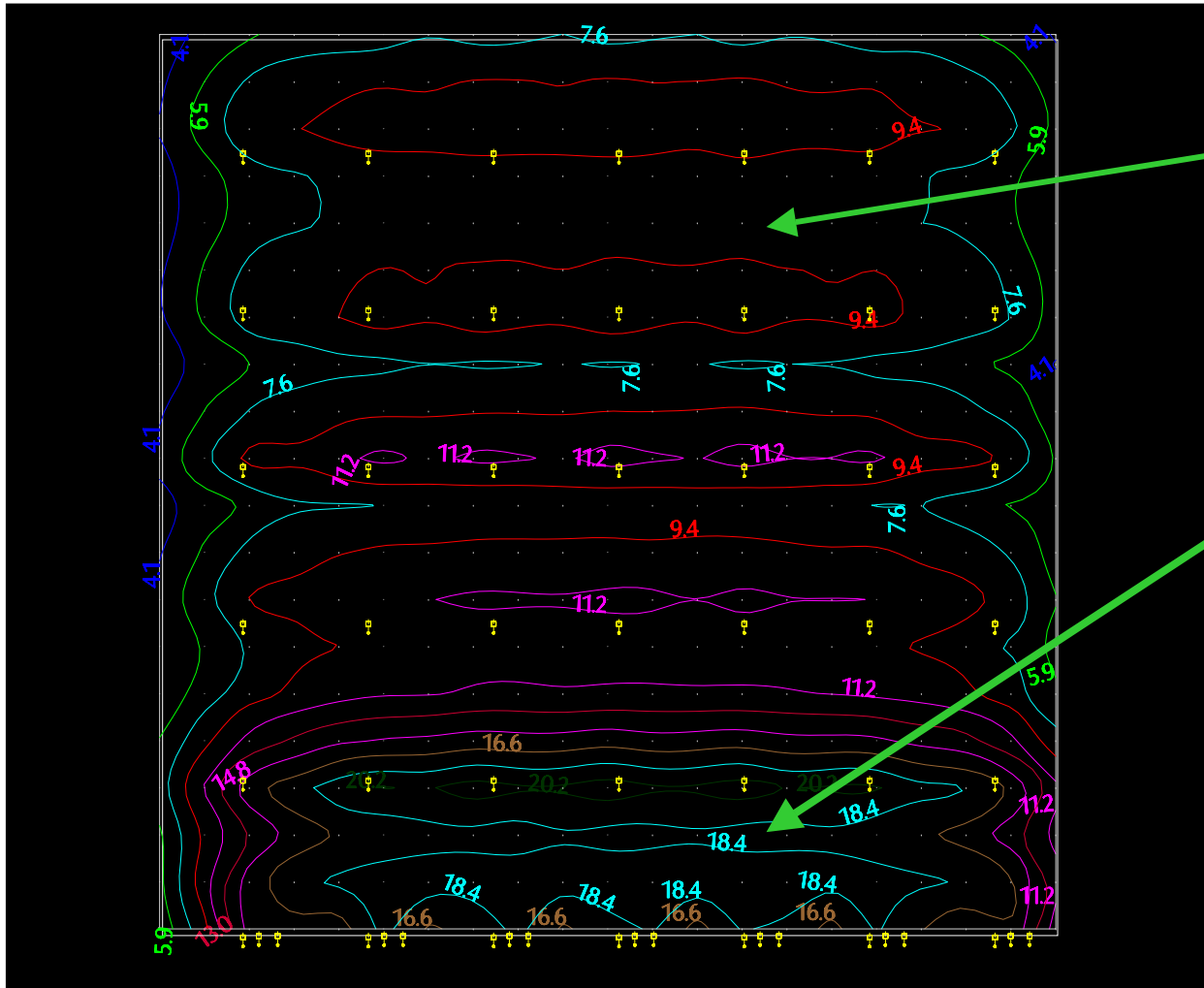
- Software: Lighting Technologies Lumen Micro 2000 Software.
- Design to slightly exceed criteria.



Outdoor Lighting

California Energy Efficiency Standards 2005

Calculation Results



Auto sales
lot 5-15 fc

Front row
of cars
15-25 fc

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Calculation Results

- Area illumination:
 - Grid of 400 watt luminaires.
 - Produces 10 fc average at 0.5 w/ft² .
- Front row illumination:
 - Additional 400 watt luminaires along frontage.
 - Produces 20 fc in zone at 35 w/lf.
- Set model = LZ3.



Recommendations

- LPD maximums in each Lighting Zone.
- Include requirements for lighting controls, maximum lighting power and shielding of luminaires.
- Requirements are expressed by lighting zones.



Lighting Allowed Power - Lot Area

Sales Area	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
	Allowed LPD	Allowed LPD	Allowed LPD	Allowed LPD
Sale vehicle lots (W/SF)	Not allowed	.25	.5	1.0
Other Outdoor Retail	Not allowed	.25	.5	1.0



Lighting Allowed Power - Lot Frontage

Sales Area	Lighting Zone 1 Allowed w/LF	Lighting Zone 2 Allowed w/LF	Lighting Zone 3 Allowed w/LF	Lighting Zone 4 Allowed w/LF
Auto Frontage	Not allowed	17.5	35	70
Other Outdoor Sales Frontage	Not allowed	17.5	35	70



Controls and Shielding

- Photosensors turn off lighting during daylight hours.
- All luminaires greater than 100 watts to be IESNA cutoff type.

